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Developing a Logic Model for the Triple-C Intervention: A Practice-Derived Intervention to Support People with Intellectual Disability and Challenging Behavior

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Abstract

Partly due to a lack of evidence-based methods to support people with intellectual disability (ID) and challenging behavior, their needs are often poorly met. One way to generate rapid evidence is to systematically describe and monitor interventions that are considered to be "good practice"—to develop evidence based on practical knowledge. This study describes the Dutch practice-based intervention Triple-C (Client, Coach, Competence). The intervention was developed in practice to support people with severe ID to borderline functioning and challenging behavior. The practice-based nature of Triple-C means that many of the professionals' actions or activities are often underpinned by their implicit knowledge about the intervention they are delivering. Consequently, as the emphasis is on practice, the professionals can find it difficult to articulate how the intervention is operationalized and positive change achieved. This study aimed to assess the practical knowledge of Triple-C professionals and to develop an understanding of the mechanisms of change for Triple-C to improve understanding and to inform future research about the intervention. Through an iterative process, a logic model was developed to describe the intervention and its underlying assumptions. The development of the logic model was shaped using interviews with the founders, focus groups with support staff, psychologists, managers and members of the board of a service provider, and the analysis of published accounts of the Triple-C intervention. Data gathered from these sources were analyzed using content analysis. The logic model of the Triple-C intervention provides insight into the key elements of the approach, such as the need for unconditional supportive relationship and carrying out meaningful activities. Moreover, the potential relationship with existing evidence-based interventions such as Positive Behavioral Support and Active Support are described. Defining the underlying logic of a practice-based intervention like Triple-C is an important first step toward producing an evidence base for interventions developed from clinical practice.

Keywords: challenging behavior, comprehensive interventions, intellectual disability, logic model, practice-based methods

Introduction

The needs of people with intellectual disability (ID) and challenging behavior are often poorly met due to a lack of appropriate support from services and professionals (Griffith & Hastings, 2014; Griffith, Hutchinson, & Hastings, 2013; Hastings, 2013). One reason for this problem might be a lack of evidence-based practice, established through the application of randomized-controlled trial designs or other robust research methods (Pilling, Marcus, Whittington, & Murphy, 2015). Even if there is scientific evidence, the feasibility and applicability of interventions in practice still needs attention. For example, Hassiotis et al. (2018) carried out a randomized controlled trial of Positive Behavior Support training for staff working with people with ID and challenging behavior. The results showed that there were no differences in the level of challenging behavior of individuals whose clinicians received Positive Behavior Support training and those who received care as usual. A process evaluation of this study identified poor delivery of Positive Behavioral Support as one possible key factor contributing to the outcome (Bosco et al., 2019). The use of evidence-based knowledge in practice might increase if knowledge from community stakeholders such as support staff or psychologists and service users were to be used to inform the development of a new intervention or in analyzing practice-based interventions (Drahota et al., 2016; Embregts, 2017; Embregts, Taminiau, Heerkens, Schippers, & Van Hove, 2018; Garretsen, Bongers, De Roo, & Van de Goor, 2007). Different forms of knowledge

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may offer complementary ways of understand good practice. For example, Schön (1983) proposed that competent practitioners usually know more than they are able to explain. According to his theory, becoming a reflective practitioner can help professionals to make their thought processes more explicit. As such, a first step toward generating evidence in collaboration with community stakeholders could be defining the underpinning theory and proposed mechanisms of change for practice-based interventions (Hastings, 2013; Hastings, Hatton, Lindsay, & Taylor, 2013).

Practice-based evidence can be generated by systematically monitoring interventions that are considered to be "good practice." In general, data are collected prospectively and/or retrospectively and focus on service user variables, processes of care, and outcomes important to other stakeholders (Bergstrom, 2008). The findings of this data collection may help to indicate the potential effectiveness of interventions developed in practice by professionals in a briefer time frame than developing completely new interventions. The coordination of information generated through such activity can go some way to building a much needed body of evidence on effectiveness (Bergstrom, 2008; Emerson & Einfeld, 2011). One of the difficulties of collecting data about practice-based interventions is that the underpinning theory and processes may not be clearly articulated by professionals or service users which developed the practice-based evidence, nor how they relate to established approaches or evidence based interventions. In this article, we describe a process to collect and analyze data to elucidate the key elements of an intervention for challenging behavior that has been developed in practice.

A variety of interventions have been developed to improve the quality of life of people with ID and challenging behavior (Banks & Bush, 2016). These interventions aim to enable people with ID and challenging behavior to increase their confidence and self-esteem through an environment which supports people with ID effectively and providing the optimal setting to support positive interactions and opportunities. Providing good-quality care and opportunities for developing interests and skills ultimately helps people with IDs to master their environment and reduces the likelihood of challenging behavior might occurring (NICE Guideline, No. 11, May 2015). Examples of comprehensive evidence-based approaches with a strong theoretical base to enhance quality of life are Positive Behavioral Support (Carr et al., 2002; Gore et al., 2013; McGill & Toogood, 1994) and Active Support (Flynn et al., 2018; Mansell & Beadle-Brown, 2012). Both interventions have a growing and robust evidence base (Bigby, Bould, Iacono, Kavanagh, & Beadle-Brown, 2019; Bosco et al., 2019) and are likely to be effective in practice if they are translated into practice as intended (i.e., delivered with fidelity). Despite the existence of these evidence-based interventions, practitioners' actions are still often based on intuition, which consists of both tacit knowledge and knowledge from their education (Welsh & Lyons, 2001). Turning this knowledge into practice, local practitioners (e.g., support staff or psychologists) may even develop their own interventions in a specific context. An example is a values-driven intervention, called Triple-C (Client, Coach, Competence) (Van Wouwe & Van de Weerd, 2011, 2015), developed in the early 1990s by local practitioners in the Netherlands. The development of this approach was stimulated by several serious scandals concerning the support of people with ID and severe challenging behavior, who were living in inadequate or inhumane services. Dutch practitioners were lacking sufficient support and needed guidance which led to the development of Triple-C. The three C's represent Client (i.e., the person with ID), Coach (i.e., the support worker), Competence (i.e., the activity which the client and coach perform together). Van Wouwe and Van de Weerd wanted to enable their service users to experience "an ordinary life"; a life as close as possible to the life of people without ID (King's Fund, 1980). Informed by attachment and social learning theories (Bandura, 1978; Bowlby, 1988), and by the normalization principle (Wolfensberger, 1983), they developed Triple-C in Dutch practice. One of the founders' central ideas is that human behavior is determined by the interaction between an individual and his or her environment, as challenging behavior can be seen as a response to a challenging environment (Flynn, Hastings, Gillespie, McNamara, & Randell, 2019; Hastings et al., 2018). Therefore, an empathic, understanding and compassionate response to challenging behavior is needed. For that reason, meeting individuals' human needs is emphasized in the intervention (Barrett, 2002; Maslow, 1943) of people with ID, ranging from people with severe to borderline IDs and challenging behavior instead of support staff trying to control the challenging behavior. By achieving a meaningful lifestyle whereby people with ID and challenging behavior receive unconditional support to improve their attachment to support staff, a positive response was tried to reach.

In the Netherlands, Triple-C is applied in 23 different service providers, which together support approximately 3,600 people with ID and challenging behavior. In 2013, an uncontrolled study was carried out to measure the effect of Triple-C by Van Wouwe, Simons, and Janssen. A longitudinal design was used to examine changes in 53 individuals with severe challenging behavior, who moved to live in a Triple-C setting. There were two data collection points before the participants moved to a Triple-C setting and three further data collection points after they moved to a Triple-C setting. Their level of functioning varied from severe ID to below average functioning. Pearson correlation tests were computed to assess the relationship between Triple-C, adaptive skills (Vineland Adaptive Behavior Scales; De Bildt, Kraijer, Sytema, & Minderaa, 2005), emotional and behavioral problems (measured by the Dutch version of Developmental Behavior Checklist; Dekker, Nunn, & Koot, 2002), and numbers of the use of restrictive measures from daily reports. The study found a positive correlation between the use of Triple-C and communicative skills (r = .503, n = 46, p = .01), daily living skills (r = .463, n = 46, p = .01), and social skills (r = .574, n = 46, p = .01). There was no significant correlation found between the use of Triple-C and emotional and behavioral problems (r = .021, n = 46). Negative correlations were found between the use of Triple-C and the use of restrictive measures: taking the participant down to the floor (r = −.251, n = 46, p = <.01), separation in designated room (r = −.551, n = 46, p = <.01) and seclude person to different room (e.g. bedroom, hallway) (r = −.642, n = 46, p = <.01). However, the practice-based nature of Triple-C means that many of the professionals' actions or activities are often underpinned by their implicit knowledge about the intervention they are

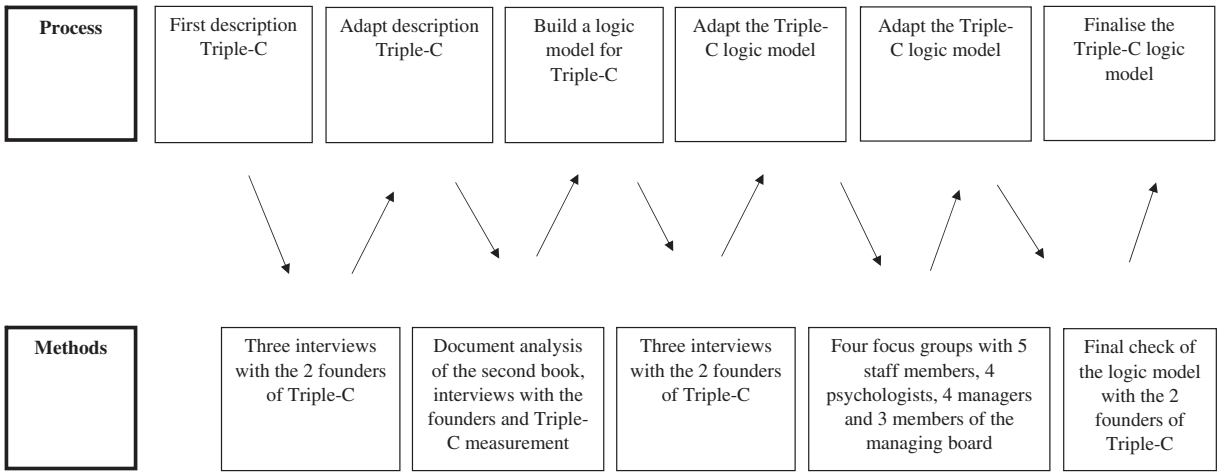

FIGURE 1

Process used to construct an logic model of the Triple-C intervention.

delivering. Consequently, as the emphasis is on practice, the professionals can find it difficult to articulate how the intervention is operationalized and positive change achieved. This study aims to assess the practical knowledge of Triple-C professionals and to develop an understanding of the mechanisms of change for the intervention to improve understanding and to inform future research.

Logic Models

Building an evidence base that informs policy and practice, along with a clear understanding of the assumptions which underpin an intervention and an explanation of how an intervention works, are needed. Depicting an intervention in a logic model can help to clarify underpinning assumptions (Moore et al., 2015). A logic model presents a plausible description of how an intervention will work under certain conditions to solve identified problems (Bickman, 1987). Logic models are related to program theory, which presents a theory of action or change that drives the intervention and are useful for describing the assumptions about resources and activities (particularly in relation to key stakeholders), as well as how these are expected to lead to intended outcomes (McLaughlin & Jordan, 2010; Shakman & Rodriguez, 2015). Scott, Denne, and Hastings (2018) suggested that logic models can also be used to evaluate the effectiveness of interventions for ID practice, which is an important step toward evidence-based practice.

Elements for a logic model include intervention components (inputs that are required to support the intervention), processes (the essential action steps necessary to produce intervention outputs and outcomes), output (the direct products of program activities), outcomes (e.g., changes, benefits, or problem reduction), and assumptions (the underlying theory of how the intervention should lead to the intended outcomes) (McLaughlin & Jordan, 2010; W.K. Kellogg Foundation, 2004). There are several ways to present a logic model, although typically this is as a diagram (Savaya & Waysman, 2005). A logic model can be developed through five stages: (1) collecting relevant information from multiple sources, (2) clearly defining the problem the intervention will solve and its context, (3) defining the elements of the model, (4) drawing the model, and (5) verifying the model with stakeholders (McLaughlin & Jordan, 2010). In this article, we focus on constructing a logic model for the practice-based Triple-C intervention by carrying out these five stages.

Developing the Triple-C Logic Model

Figure 1 describes the process as well as the methods used to develop a logic model for the Triple-C intervention. Ethical approval for this process was obtained from Tilburg University (EC-2015.29).

The development process began with an initial description of Triple-C, which featured the significant elements of the intervention and gave an insight into knowledge gaps of the researchers. The description was based on the available official documents about the intervention, including the first book about the Triple-C intervention (Van Wouwe & Van de Weerd, 2011) and Triple-C training and teaching materials (developed by the founders). Subsequently, three semistructured interviews with the founders of the intervention were carried out by the first author. The aims of these interviews were (1) to become more familiar with the Triple-C intervention, (2) to test whether the interpretations of the official documents were accurate, and (3) to fill gaps (unclear, incomplete, or missing information) in the description with the founders' implicit knowledge. The interviews provided

additional details, but there was still missing information. For example, the descriptions of how different professionals (support staff, psychologists, and managers) should apply Triple-C in practice remained unclear, the mechanisms of change were also unclear, and the proposed outcomes of the intervention for different stakeholders were not specified clearly.

To provide more information, three types of official documents about the Triple-C intervention were selected for analysis: the second book about the intervention written by the founders of Triple-C (Van Wouwe & Van de Weerd, 2015), a questionnaire that is used to measure whether Triple-C is delivered with fidelity (Van Wouwe, Simons, & Janssen, 2011), and the first three interviews with the founders. These documents were selected because they contained the most exhaustive and contemporary information about Triple-C. A qualitative content analysis (Thomas, 2006; Wildemuth, 2016) was used to condense data obtained from the documents into categories or themes based on valid inference and interpretation. The software program Atlas.ti. (Friese, 2019) was used to help carry out these analyses.

Following the content analysis procedure, the information about Triple-C was summarized in a draft logic model. All the categories identified were allocated to the different elements of a logic model. The founders of Triple-C were then interviewed a further three times about the content of this draft logic model (version 1). These interviews focused on the founders' perspectives on the themes, how the logic model was built (different columns and categories) and aimed to clarify codes from the content analyses which remained unclear. Feedback from the interviews was processed and this resulted in an adapted logic model (version 2).

Without a formal manual of the Triple-C intervention, it could not be assumed that the intervention was being delivered according to the developers' logic. Therefore, version 2 of the logic model was tested in focus groups with support staff, managers, psychologists, and a group of other professionals who were involved with the implementation of Triple-C. Professionals were selected by the Triple-C founders, based on their extensive expertise with the intervention. In total four psychologists, four managers, five support staff members, and three other professionals (a member of the board of directors, head of human resources, and treatment manager), all from the same service provider, participated in separate focus groups. Homogeneous groups were explicitly chosen because different professionals are likely to bring different perspectives to the intervention, depending on their training and different roles in services.

Each focus group lasted 2 hr and the meetings were audiotaped and transcribed verbatim afterward. A framework analysis (Krueger, 1994; Ritchie & Spencer, 1994) was used to analyze the information from the focus groups with professionals. The logic model functioned as the framework and an a priori question was set: Do the data from the focus groups confirm, complement, or contradict the data in the logic model? Confirming and complementary codes were generated through this process of analysis and small adaptations were made to the logic model (version 3).

The penultimate version of the logic model was discussed with the two founders of Triple-C. Based on their comments, a final version of the logic model was produced.

The Triple-C Logic Model

Figure 2 shows the final version of the Triple-C logic model. The purpose of the model is to set out the required elements of the intervention to achieve the intended outcomes. All participants, especially the founders, emphasized that for the effective implementation of Triple-C, a combination of skilled professionals and a service which is steeped in the vision and Triple-C values are needed.

Main Goal

The text box for the overall aim of the intervention describes *the main goal of Triple-C*: people with ID experience an ordinary life as much as possible (note that "ordinary" is considered to be a relative concept here, given the nature of the challenging behavior, adjustments to the environment have to be made, but only as much as needed).

Assumptions

The bottom box represents *the assumptions* that underpin the intervention and is regarded as the vision of Triple-C. Individuals at all organizational levels are expected to think, watch, and act from the same vision. Triple-C's core assumption is that people's environments play a key role in determining their behavior. The intervention focuses on influencing the environment of a person with ID to meet their fundamental human needs as described by Maslow (1943) and Barrett (2002): physical, emotional, mental, and meaningful needs. It is hypothesized that these needs have to be met to allow the person with ID to have a good quality of life and eventually reduce the challenging behavior (Triple-C proponents actively describe this reduction as a "side effect").

To meet human needs in practice, the vision of Triple-C employs three "pillars": (1) an unconditional professional supportive relationship between the person with ID and support staff, (2) the provision of meaningful daytime activities, and (3) a "different perspective" on challenging behavior (i.e., trying to understand why these behaviors occur; asking which human needs are not met). It is hypothesized that by engaging in an unconditional professional supportive relationship with the person with ID, support staff need be able to create a safe and secure (social) environment in which they can truly connect with the person with ID (physical and emotional needs). This relationship is built by doing meaningful daily activities together (in the competence areas of personal care, leisure, work/education, and living) in a safe, consistent, and predictable environment (physical, mental, and meaningful needs). Furthermore, support staff need to be able take a "different perspective" on challenging behavior; they can interpret challenging behavior as a signal that they are not fulfilling the human needs of a person with ID effectively, instead of seeing challenging behavior as a symptom which need to be eliminated by medicine or restrictions. Although the main focus of the intervention is on the person with ID, the assumptions also apply to the collaboration with and support of staff. As a consequence, adopting Triple-C

Overall aim of Triple-C: Support people with intellectual disability and challenging behaviour to experience an ordinary life as much as possible.

Intervention components

Value driven organisation
- Triple-C values for professionals

General attitudes Triple-C professionals
- Passionate, enthusiastic and proud
- Unprejudiced and respectful
- Convinced of possibilities
- Willing to learn and invest
- Trust

General competencies Triple-C professionals
- Understand and implement rationale of Triple-C
- Reflect on own behaviour/motive and develop (new) skills

Competencies Triple-C support staff
- Able to focus on possibilities/perspective
- Can cope with own stress level in order to be able to support unconditionally in all situations
- Sensitive: signal, understand and assess functions of behaviour
- Able to attune to needs and capabilities
- Can apply basic behaviour principles

Organisational features
- Structure of an organisation
- Training and coaching
- Climate of an organisation
- Organise attachment
- Professionals have own responsibilities
- Time to invest in relationship building, development and reflecting on own behaviour
- Regular meetings among professionals (and person with intellectual disability)

Mechanisms of Impact

In all the levels of an organisation: by carrying out meaningful activities together, it is assumed that a relationship is built between people, competencies increase, and people gain more trust in their environment.

Staff level

Person with intellectual disability and support worker carry out meaningful activities together. Support worker ensures that these are completed successfully.
- Together:
  Support worker adapts to needs of person with intellectual disability by:
  - Knowing the person with intellectual disability
  - Understanding the function of behaviour of the person with intellectual disability
  - Supporting during both positive and negative situations
- Meaningful:
  - Adapted to the level of functioning of the person with intellectual disability
  - Fits to the perspective (and interest) of the person with intellectual disability
  - Falls within one of the four competence areas (which together represent the ordinary life)
  - Is part of a consistent and predictable daily program
- Successful:
  - Adapted to the level of functioning of the person with intellectual disability
  - Level of support is attuned to the needs of the person with intellectual disability

Organisational level

Psychologist – manager – team captain support and guide support workers on how to support the person with intellectual disability by:
- Psychologist designs intervention and advices staff
- Team captain coaches his team during daily situations
- Manager coaches the team captain and facilitates treatment

Culture of a health care organisation
- Vision, Triple-C values, and same collective ambition
- Continuous dialogue
- Focus on possibilities and opportunities
- Complementary

Outcomes

Effects on level of person with intellectual disability
- Has more competencies
- Is more confident
- Has more trust in others
- Can take more responsibilities
- Can influence his own life in a positive way
- Can take more initiatives
- Is less stressed and shows less challenging behaviour as a result of more self-control of their own behaviour
- Better health, less medication and seclusion
- Achieving in life
  - Experience an ordinary life as much as possible
  - Fulfils meaningful activities in daily life
- Relationships
  - Has positive relationships with family, friends and support staff
- Personal safety
  - Is more stress-resistant
  - Moves to less restricted environment
- Community connectedness
- Future perspective

Effects on level of support staff
- Experience improved job satisfaction at work
- Feel more passionate about their job
- Have more competencies
- Feel more confident
- Have more responsibilities
- More aware of their influence on behaviour of person with intellectual disability
- More aware of interdependent relationship with person with intellectual disability
- Less burn out

Effects on organisational level
- Triple-C evolves itself by new understandings of practice

Assumptions: Triple-C focusses on influencing the environment of a person with intellectual disability by fulfilling the fundamental human needs: physical-, emotional-, mental- and meaningful. Three pillars are employed in practice to fulfil these human needs: 1) an unconditional professional supportive relationship between person with intellectual disability and support staff, 2) provide meaningful daytime activities and 3) have a different perspective on challenging behaviour.
It is assumed that as a result of the fulfilled human needs, the mental health of person with intellectual disability and their quality of life will improve.

FIGURE 2

Logic model Triple-C intervention.

as a healthcare organization and working as a professional in line with these Triple-C assumptions, there are hypothesized to be effects on the collaboration, culture, and outcomes for professionals.

Intervention Components

According to the documents and the participants, the Triple-C intervention consists of a vision (Assumption box) and a method (Intervention components and Mechanisms of Change box) which are considered inseparable. To implement the vision and method effectively, the model requires active and positive involvement at all levels in an organization. This vision expresses itself in *Triple-C values* which correspond with the human needs. According to Triple-C, all professionals in an organization need to be able to operate from these Triple-C values toward people with ID and their colleagues:

- People need other people to become, and stay, a human being.
- Life-enhancing environments elicit positive human behavior.
- Experiencing unconditional support leads to feelings of recognition and being appreciated.
- Living together in a social group requires mutual respect and interdependence.
- Every person has the right to control and influence their own life.
- Quality of life is a cocreation of an interaction between individuals and their (social) environment.
- In interaction with their environment, people want to give meaning to life.

General attitudes and competencies (second and third component in the intervention column) are thought to be required for all Triple-C professionals. A general attitude is to be willing to learn and to invest in each other and oneself. Reflecting on

one's own behavior is considered to play a significant role in developing (new) skills, as well as in having the courage to put oneself in a vulnerable position and having trust in one's own potential and the person with ID. In line with the general vision in care for people with ID, Triple-C professionals need to be able to involve relatives of people with ID in their lives but also to be able to collaborate with relatives, in complex situations.

It is hypothesized that support staff working with people with ID on a daily basis need *specific competencies* to support in line with the vision and to apply the method sufficiently. A competence which is regarded as significant is having the capacity to focus on the potential of a person with ID, even in the most complex situations instead of focusing on their challenging behavior. Within Triple-C, support staff are expected to be stimulated to support the person with ID unconditionally without conducting exclusion or punishment interventions. It is assumed that this requires support workers who can cope with their own stress level in complex situations, who are able to support the person with ID in emotionally charged circumstances, who are sensitive, and have the competence to see/feel the needs of the person with ID. Lastly, support staff need to be able to understand and to apply basic behavior principles like shaping (e.g., the process of reinforcing successively closer and closer approximations to a desired terminal behavior like having dinner with fork and knife), fading (e.g., decreasing the level of support needed to cook a meal), chaining (e.g., breaking down the activity in smaller steps and supporting the individual to carry out steps in the right sequence), prompting strategies (taking the individual's hand and guiding them through an activity) and also modeling (e.g., support worker brushes his teeth, the person with ID imitates this activity).

The first *organizational feature* in the model is the structure of a Triple-C organization. Based on the interviews and focus groups, team work is viewed as a very significant element of the intervention, as using Triple-C with people with challenging behavior is challenging for support workers themselves. The lines of communication between the different members of the team are direct, so that professionals can respond quickly to the needs of the person. In the structure of an organization, a team of support workers is supported by a psychologist, manager and team captain (in Triple-C terms known as the "support-triangle") on a structural basis. The members of the support-triangle have their own roles and complementary tasks as described in the *process* section. However, these individual roles should be underpinned by a sense of shared responsibility to ensure optimal care is provided by the team of support workers, in order to promote the well-being of the person with an ID. Additionally, the support-triangle has the so-called "line crossing authorities" which implies that—if needed—the members are allowed to take over the tasks of a colleague. For example, a psychologist can take over a management task (temporarily). This might be valuable in case one professional of the support-triangle is less experienced in working according to Triple-C.

The second organizational feature is to get a better understanding of the vision, Triple-C values and the method. All (new) Triple-C professionals are requested to attend 1 or 2 days of training annually, to keep their understanding, knowledge and skills of the intervention up to date. The training is provided by the founders of the intervention or other trainers (trained by the founders; mainly psychologists and team captains). In addition, professionals need to be coached on the job by the team captain and more experienced colleagues. It is considered that constant reflection is needed on their own functioning and how they apply the vision and Triple-C values in practice. This reflection is supposed to contribute to a better understanding of their own actions, motivation and values, and the vision.

The healthcare organization is expected to create a supportive atmosphere, the third organizational feature, for individuals with ID and professionals. It is assumed this requires an open, transparent climate and policy to create a learning climate in which professionals can develop their skills and practice. Eventually, it is hypothesized that professionals should feel more connected with each other by all working from the same vision and values.

The fourth feature is to organize attachment: the feeling of relatedness/connection among professionals as well as attachment between professionals and people with ID. This attachment is assumed to be promoted by creating a warm and supportive work environment, where people feel secure and committed. A secure base might contribute to exploration and development by all participants. A practical implication of promoting attachment is working with small teams (eight staff members, a team captain, psychologist and manager) and trying to avoid too many personnel changes.

It is assumed that professionals can better attune to the needs of people with ID in different settings and situations when they are allowed to make their own decisions on which support would be sufficient (fifth organizational feature). They are not rigorously pinned to a fixed response, which describes how to respond to the behavior of the person with ID regardless the situation.

Processes

Staff level. The second column of Figure 2 describes the mechanisms of change of the intervention according to the documents and participants. As Triple-C is used to support very different groups of people with ID, the intervention is supposed to offer a broad framework that can be adapted to address the different needs. The core of the Triple-C intervention is that the person with ID and support workers carry out meaningful activities together with the aim of building a relationship between people and to increase their competencies. The support worker needs to try to ensure that meaningful activities are completed successfully as a positive reinforcer.

Together

The activities are carried out together by the person with ID and the staff member. Staff support unconditionally, especially in stressful situations, is thought to contribute to the development of a relationship of trust (e.g., the person with an ID needs to be able to rely on their support staff, no matter what type of behavior they are showing). During the first (introductory) phase, staff develop an understanding of the function of the challenging behavior by reflecting about the behavior with their colleagues and a psychologist (during or after their shift and

during their regular team meetings). Function is described in relation to the human needs being expressed. Staff discuss how they can adapt their support to meet the needs of the person with ID. When the person gets more familiar with his or her new environment, the daily program becomes more personalized and goals for the treatment are set (never focused on reducing challenging behavior, always on how the person can be helped to experience "an ordinary life" by carrying out daily activities). These goals are established in collaboration with the person with an ID and the psychologist. So support staff need to know the person with ID (history, family/social context, interest or dislike, general skills and abilities, communication styles, and disorders; information is obtained from relatives, other involved professionals) to help them understand which human needs are not met and respond appropriately. To build up this knowledge and a shared understanding about the person with ID, support staff and the psychologist discuss the needs of a person in regular joint meetings. In addition, the psychologist and team captain (or key worker) involve relatives to learn more about the history of a person with ID.

Meaningful

Living in a Triple-C home means from the start participating in a consistent and predictable daily activity program. This should include activities of the four Triple-C competence areas: leisure, work/education, personal care, and living. Furthermore, the activities fit to the interest of the person with ID and they are focused on their development (perspective). Meaningful activities need to be adapted to the level of functioning of the person with an ID by breaking down complex activities into steps and/or adapting the level of support (depending on the person's capabilities, on day-to-day opportunities, and competencies of the support worker) so the person with ID can carry out the activity as independently as possible.

Successful

Completing the activities successfully may contribute to the relationship of trust among the individual with ID and support staff.

Organizational level. The second element in the process column is the organizational features. Support staff need guidance and assistance from the support-triangle on how to support people with challenging behavior, especially in stressful situations. Therefore, members of the support-triangle regularly visit the location of day-to-day care. It is hypothesized that providing clear guidance and support to a team requires: (1) a strong collaboration among all the members of the support-triangle, based on equality and trust, and (2) regular reflection on whether the support-triangle is acting according to Triple-C values to make sure everyone is working along the same lines. All members of the support-triangle have their own roles and tasks. The psychologist designs the Triple-C intervention for each person with ID and supports staff to create a pedagogical and congenial climate. The team captain supports the team to translate the advice of the psychologist into practice from an expert-companionship perspective and by giving coaching on the job. Collaboration between a psychologist and team captain is significant, since the team captain provides the psychologist with information about daily functioning of the people with ID and challenging behavior as well as about support staff. With respect to the manager, two main tasks can be identified based on the interviews and focus groups: (1) facilitating the intervention (e.g. finances, hire staff), and (2) coaching the team captain on how to support his/her team to work according the Triple-C vision and values.

The final topic in the logic model process column is *the culture of a healthcare organization*. It is important that the whole system is steeped in the vision and Triple-C values; all forms of consultation are conducted from these two perspectives. Professionals are supposed to have the same collective ambition and have a continuous dialogue about how they apply the vision and values in practice. To support the person with ID to experience an ordinary life as much as possible, professionals need to be able to focus on opportunities in (collaborative) decision making.

Outcomes. The final column (*outcomes*) depicts the outcomes for the different stakeholders of the intervention; people with ID, professionals, and organization. The Triple-C intervention components and processes are proposed to have a positive effect on the personal competencies and quality of life of people with ID as well as professionals. It is assumed the person with ID will: (1) feel more confident because of the increased competencies, (2) be able to handle more responsibilities and control over their own life, (3) develop more trust in other people and themselves, and (4) as a result have less stress and less challenging behavior. Their quality of life is also assumed to improve because: (a) their daily program is filled with meaningful activities, allowing them to experience a more ordinary life, and (2) they have more positive relationships with family, friends and staff, and feel more security. The use of psychotropic medication and seclusion should also diminish and some people should be able to move to a less restricted environment.

A potential outcome for support staff is to experience improved job satisfaction and passion for their job. As a result of the training, coaching on the job and regular reflection, it is hypothesized that they should develop more competencies, confidence, and will be able to cope with greater responsibility. It is assumed that these positive improvements will result in less support staff burnout.

Discussion

Triple-C is a Dutch practice-based intervention for supporting people with ID and challenging behavior, which has now been applied in Dutch practice for more than 25 years. This study is an important first step toward further development of this practice-based intervention by making tacit knowledge of professionals more explicit. Through an iterative process, a logic model was developed to describe the intervention and its underlying assumptions. The development of the logic model was shaped by using interviews with the founders, focus groups with professionals, and the analysis of published accounts of Triple-C. The result, a conceptual description of the intervention, can be the first step to inform robust research to examine Triple-C's potential effectiveness.

The process of development of Triple-C is different compared to data-driven interventions such as Positive Behavioral Support and Active Support. These interventions are underpinned with scientific evidence (Flynn et al., 2018; Gore et al., 2013). Triple-C on the other hand is based on practice-based knowledge. Starting an intervention based on knowledge from professionals like psychologists and support staff gives scientists the opportunity to learn from a valuable source of professional knowledge, which can contribute, alongside scientific knowledge to the care of people with ID (Embregts, 2017; Garretsen et al., 2007). Practice-based knowledge is developed by professionals through learning and reflecting on their work, and the reactions of people with ID and support staff toward interventions.

A next significant step in developing a practice-based intervention like Triple-C is to examine whether Triple-C or elements of the intervention can be underpinned with already existing evidence of evidence-based interventions in ID. Triple-C shows similarities with Positive Behavioral Support and Active Support. Like Positive Behavioral Support, Triple-C focuses in the long term on an improved quality of life, has a values driven approach and a comprehensive character. Both interventions are multicomponent framework interventions whereby different elements should be used in combination to implement the intervention effectively. Both approaches are informed by the values of normalization, human rights, and self-determination to deliver effective person-centered support to people with challenging behavior. However, Positive Behavioral Support, in contrast to Triple-C, is a functionally informed intervention which also uses direct behavior change technologies to reduce challenging behavior. Unlike Triple-C, Positive Behavioral Support also includes a range of evidence-based and clearly specified behavior change technologies to directly enhance skills and learning in those with ID. In Positive Behavioral Support, socially valid interventions are also included to enhance quality of life outcomes for both the person themselves and their paid or family carers (Carr et al., 2002; Gore et al., 2013). Triple-C does not explicitly include targeting outcomes for family members like Positive Behavioral Support does, but do try to enhance the quality of life outcomes for both the person themselves and their paid carers. Giving family members a more prominent place in the intervention would be a valuable addition. Also, Triple-C shows similarities with Active Support in terms of the focus on engagement in meaningful daily activities. Active Support is, like Triple-C, a person-centered approach which aims to enable people with ID to experience a rich and varied lifestyle in which their participation and independence is directly facilitated by the help and encouragement provided by staff. Active Support includes initial workshop training and one-to-one Interactive Training of staff in everyday support settings (Toogood, 2010). Triple-C professionals receive coaching on the job, but this is ongoing rather than being an initial clearly specified (and manualized) aspect of the intervention as in Active Support. Next, Active Support includes the completion and monitoring of plans and documents for each individual, to ensure continuing high levels of engagement (Flynn et al., 2018). Although, each individual's record is annually reviewed, and documents to register the progress towards set goals are also available in the Triple-C intervention, they are not used on an everyday basis like the recording systems in Active Support. This might be a possible addition to the current Triple-C intervention to support a high level of engagement. Further research on the day-to-day delivery of Triple-C should reveal the amount of overlap with other interventions such as Positive Behavioral Support and Active Support.

In countries such as the UK and the Netherlands, Triple-C, Positive Behavioral Support and Active Support are developed in parallel for people with ID (and challenging behavior). As such, there are general and comparable effective intervention components in, for example, Triple-C and Positive Behavioral Support (e.g., value driven and match support with each person's capabilities), that are likely to be effective in different countries. However, aspects of evidence-based interventions may not always be transferable (Gabbay & Le May, 2004; Ioannidis, 2016) and the social and cultural context may have a significant influence on the use and development of care interventions. For example, Dutch care for people with ID is strongly influenced by the orthopedagogical perspective (van Gennep, 1997) resulting in more emphasis on the contextual factors of support, whereas other interventions focus more on support of the individual without taking contextual factors into account.

A potential limitation of Triple-C is that a focus on the bigger picture (e.g., good relationships and an active life) may have been at the expense of a detailed description of how to deliver the intervention in practice. It is reflected in the final logic model, which emphasizes values and ideas and not the practicalities or details of the intervention. In addition, in the logic model, no elements are linked specifically because the researchers focused on gathering information about the essential Triple-C elements without focusing on specific relations. To be able to carry out research on Triple-C in future, additional steps are needed. First, expected coherence between elements in the logic model should be identified; to determine which elements might influence which processes and outcomes. Then it would be possible to formulate more specific hypotheses for future research. Second, a limitation of the logic model is that the differentiation between short and longer term outcomes is missing. Future work is needed to clarify these outcomes, which could be in another iteration of the logic model. Third, mechanisms of change need to be defined in more detail, to provide guidance about what people need to *do*, on a day-to-day basis to deliver Triple-C. Last, and related to the third point, is then a clearer tool for evaluating and reviewing when Triple-C is being delivered or the level of quality of the delivery of Triple-C (i.e., treatment fidelity). An observational study of what staff do in practice in Triple-C settings would be a useful next step to help define the intervention components.

Building the Triple-C logic model was a complex process including challenges that may apply to defining practice-derived interventions. First, the founders of the intervention had strong beliefs about what they do, rooted in long years of experience. The process involved having respect and sensitivity about the founders' views, whilst finding a way of making their tacit knowledge explicit. At the same time, the researcher also needed to examine in more detail than has been described to date how professionals interpret the intervention and think how it should

be applied in practice. Second, after clarifying the aims of the project, appropriate methods and participants were selected to obtain the necessary information, through a series of iterative steps, such as reflecting with different stakeholders (scientists and practitioners), adopting mixed methods, involving a range of participants, and collecting different types of data so that different perspectives on the intervention were taken into account. This iterative approach was a way of trying to avoid overlooking significant elements. Moreover, the researchers noticed that not all the information could be gathered from one source. Multiple sources were needed to get a clear understanding of the intervention. For example, each group of professionals had their own experiences with and phraseology about the intervention due to their different daily tasks (e.g. psychologists talked more about setting treatment goals, staff members talked more about how they worked on building a relationship). The researchers had to check during the interviews and focus groups if all the participants meant the same with regard to the vision and method. In the end, there were no major inconsistencies. When inconsistencies were found, the researcher went back to the founders to check how the vision or method was intended to be implemented.

In the further development of Triple-C intervention, it would be valuable to take into account the views and experiences of people with ID and challenging behavior. Furthermore, the logic model is focused on people with ID within settings where they are supported by staff. However, many people with ID live with the support of their family members or family members are a central part of their lives. Further consideration should be given to whether family members could use a Triple-C model as well as whether family members can be involved in Triple-C teams that are led by support staff. This addition could be explained by social systems theory, which deals with the complexity and interdependencies of social relations (Coleman, 1986).

The advantage of building the logic model of the Triple-C intervention is that it can identify dimensions that could be important for future implementation and research. This includes describing how staff and individuals can carry out meaningful activities together and how staff can provide unconditional support. Furthermore, the model could be used to measure the core outcomes, at the level of a person with ID and staff level, to examine effectiveness. This study is an example of how (practice-based) interventions in the field of ID could use logic models to guide evaluation of practice, policy and research interventions. Last, this study has shown how the cultural context can have a significant influence on the use and development of care interventions.

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Conflict of Interest

The research was funded by ASVZ, a health care service in the Netherlands. The first researcher is employed by ASVZ and detached as a science practitioner at Tilburg University. ASVZ has not imposed any restrictions on free access to, or publication of, the research data. Furthermore, the research team included external researchers with no links to ASVZ. All authors declare that they have no conflict of interest. All authors listed have contributed sufficiently to the project to be included as authors, and all those who are qualified to be authors are listed in the author by line.

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